**Level 1: Basic ASCII Coding**

1. Research the "ASCII Code"
   1. Explain what ASCII stands for.

ASCII stands for “American Standard Code for Information Interchange”.

* 1. Explain how to convert a letter into an ASCII coded number

To convert a letter into an ASCII coded number, you must look at what the character is shown in decimal.

* 1. Explain how to de-code an ASCII number into a letter

To de-code an ASCII number into a letter, you must look at what the number in the decimal section is shown in character.

1. Open a new Python Repl and run the sample program provided at the end of this module.
   1. Briefly summarize what the "asciiCodes" list does

The “asciiCodes” list tells Python that the given special character is a certain letter.

* 1. Briefly summarize what the "textCoder" function does

The “textCoder” function converts the letters into a three digit number and the first number is a 0.

* 1. Briefly summarize what the "textDeCoder" function does

The “textDeCoder” function converts the coded number into a specific letter.

* 1. Briefly summarize what the main program code does

The main program code converts the user inputted letter into an ASCII coded number and it decodes the user inputted ASCII code into a letter.

1. Explain the main limitation of the program.

The main limitation of the program is that it can only convert “A”, “B”, “C”, “D”, “a”, “b”, “c”, and “d” into an ASCII code number because there are only 6 conversions of the ASCII code written to the program.

**Level 2: Extending The Program**

1. Modify the sample program to do the following (Still using the ASCII code):
   1. Code all of the uppercase and lower case letters
   2. Code the digits 0 to 9
   3. Code at least 5 special characters (e.g. "1?$%&")
2. Verify that your program works for ***coding*** a message containing all of the basic and special characters.
   1. Provide a sample of your program output below.

Enter a password to code.

password: ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz0123456789!#$%&?

Coded string is: 000 097 098 099 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 048 049 050 051 052 053 054 055 056 000 033 035 036 037 038063

1. Verify that your program works for ***de-coding*** a message containing all of the basic and special characters.
   1. Provide a sample of your program output below.

Enter a password to code.

password: ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz0123456789!#$%&?

Coded string is: 065 066 067 068 069 070 071 072 073 074 075 076 077 078 079 080 081 082 083 084 085 086 087 088 089 090 097 098 099 100 101 102 103 104 105 106 107 108 109 110 111 112113 114 115 116 117 118 119 120 121 122 048 049 050 051 052 053 054 055 056 057 033 035 036 037 038 063

Enter a coded password to decode

(or return to use the Coded string)

Code:

DeCoded string is: ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz0123456789!#$%&?

**For this program, I clicked “Return” to use the coded message for de-coding.**

1. List your program modifications below:

"""

This program is currently limited to converting only the

characters "ABCD" and "abcd". The "asciiCodes" list can be easily

extended to include more letters and special characters.

This program currently uses the ASCII codes for converting text.

You can easily create your own secret code by changing the numbers

in the "asciiCodes" list.

"""

asciiCodes = [("A",65),("B",66),("C",67),("D",68),("E",69),("F",70),("G",71),("H",72),("I",73),("J",74),("K",75),("L",76),("M",77),("N",78),("O",79),("P", 80),("Q",81),("R",82),("S",83),("T",84),("U", 85),("V", 86),("W",87),("X",88),("Y",89),("Z",90)]

asciiCodes += [("a",97),("b",98),("c",99),("d",100),("e",101),("f",102),("g",103),("h",104),("i",105),("j",106),("k",107),("l",108),("m",109),("n",110),("o",111),("p",112),("q",113),("r",114),("s",115),("t",116),("u",117),("v",118),("w",119),("x",120),("y",121),("z",122)]

asciiCodes += [("0",48),("1",49),("2",50),("3",51),("4",52),("5",53),("6",54),("7",55),("8",56),("9",57)]

asciiCodes += [("!",33),("#",35),("$",36),("%",37),("&",38),("?",63)]

# This function codes the specified textChar into a

# three digit number padded with zeroes

def textCoder(textChar) :

for textCode in asciiCodes :

if (textCode[0] == textChar) :

return format(textCode[1],'03')

return "000"

def textDeCoder (codedChar) :

if (codedChar == "") or (codedChar == "000") :

return " "

for textCode in asciiCodes :

if (textCode[1] == int(codedChar)) :

return textCode[0]

return " "

# MAIN PROGRAM CODE STARTS HERE

print("Enter a password to code.")

textIn = input("password: ")

codeOut = ""

for textChar in textIn :

codedChar = textCoder(textChar)

codeOut = codeOut + codedChar + " "

#print("char: ",textChar," ASCII Coded char: ", codedChar)

print("Coded string is: ",codeOut)

print(" ")

print("Enter a coded password to decode")

print("(or return to use the Coded string)")

codeIn = input("Code: ")

if codeIn == "" :

codeIn = codeOut

codeList = codeIn.split(" ")

textOut = ""

for codedChar in codeList :

if (codedChar != "") :

textChar = textDeCoder(codedChar)

textOut += textChar

#print("ASCII Coded char: ", codedChar," decoded char: ",textChar)

print("DeCoded string is: ",textOut)

**The areas that I have highlighted are the ones that I have added into the modified code.**

**Level 3: Creating A Secret Code**

1. Modify the sample program to create your own secret code that is different from the ASCII code:
   1. Work with a partner to create a secret code that codes letters and characters into different letters and characters.
   2. Your program should be able to create a coded message that   
      you can give to your partner
   3. Your program should be able to de-code a coded message that   
      you get from your partner
2. Provide a sample of your program output below.

Enter a password to code.

password: ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz0123456789!#$%&?

Coded string is: 068 069 070 071 072 073 074 075 076 077 078 079 080 081 082 083 084 085 086 087 088 089 090 065 066 067 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 097 098 099 051 052 053 054 055 056 057 048 049 050 037 038 063 033 035 036

Enter a coded password to decode

(or return to use the Coded string)

Code:

DeCoded string is: ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz0123456789!#$%&?

* 1. Show how your program codes a secret message

asciiCodes = [("A",68),("B",69),("C",70),("D",71),("E",72),("F",73),("G",74),("H",75),("I",76),("J",77),("K",78),("L",79),("M",80),("N",81),("O",82),("P", 83),("Q",84),("R",85),("S",86),("T",87),("U", 88),("V", 89),("W",90),("X",65),("Y",66),("Z",67)]

asciiCodes += [("a",100),("b",101),("c",102),("d",103),("e",104),("f",105),("g",106),("h",107),("i",108),("j",109),("k",110),("l",111),("m",112),("n",113),("o",114),("p",115),("q",116),("r",117),("s",118),("t",119),("u",120),("v",121),("w",122),("x",97),("y",98),("z",99)]

asciiCodes += [("0",51),("1",52),("2",53),("3",54),("4",55),("5",56),("6",57),("7",48),("8",49),("9",50)]

asciiCodes += [("!",37),("#",38),("$",63),("%",33),("&",35),("?",36)]

* 1. Show how your program de-codes a secret message

print(" ")

print("Enter a coded password to decode")

print("(or return to use the Coded string)")

codeIn = input("Code: ")

if codeIn == "" :

codeIn = codeOut

codeList = codeIn.split(" ")

textOut = ""

for codedChar in codeList :

if (codedChar != "") :

textChar = textDeCoder(codedChar)

textOut += textChar

print("DeCoded string is: ",textOut)

1. List your program modifications below:

"""

This program is currently immited to converting only the

characters "ABCD" and "abcd". The "asciiCodes" list can be easily

extended to include more letters and special characters.

This program currently uses the ASCII codes for converting text.

You can easily create your own secret code by changing the numbers

in the "asciiCodes" list.

"""

asciiCodes = [("A",68),("B",69),("C",70),("D",71),("E",72),("F",73),("G",74),("H",75),("I",76),("J",77),("K",78),("L",79),("M",80),("N",81),("O",82),("P", 83),("Q",84),("R",85),("S",86),("T",87),("U", 88),("V", 89),("W",90),("X",65),("Y",66),("Z",67)]

asciiCodes += [("a",100),("b",101),("c",102),("d",103),("e",104),("f",105),("g",106),("h",107),("i",108),("j",109),("k",110),("l",111),("m",112),("n",113),("o",114),("p",115),("q",116),("r",117),("s",118),("t",119),("u",120),("v",121),("w",122),("x",97),("y",98),("z",99)]

asciiCodes += [("0",51),("1",52),("2",53),("3",54),("4",55),("5",56),("6",57),("7",48),("8",49),("9",50)]

asciiCodes +=

[("!",37),("#",38),("$",63),("%",33),("&",35),("?",36)]

# This function codes the specified textChar into a

# three digit number padded with zeroes

def textCoder(textChar) :

for textCode in asciiCodes :

if (textCode[0] == textChar) :

return format(textCode[1],'03')

return "000"

def textDeCoder (codedChar) :

if (codedChar == "") or (codedChar == "000") :

return " "

for textCode in asciiCodes :

if (textCode[1] == int(codedChar)) :

return textCode[0]

return " "

# MAIN PROGRAM CODE STARTS HERE

print("Enter a password to code.")

textIn = input("password: ")

codeOut = ""

for textChar in textIn :

codedChar = textCoder(textChar)

codeOut = codeOut + codedChar + " "

#print("char: ",textChar," ASCII Coded char: ", codedChar)

print("Coded string is: ",codeOut)

print(" ")

print("Enter a coded password to decode")

print("(or return to use the Coded string)")

codeIn = input("Code: ")

if codeIn == "" :

codeIn = codeOut

codeList = codeIn.split(" ")

textOut = ""

for codedChar in codeList :

if (codedChar != "") :

textChar = textDeCoder(codedChar)

textOut += textChar

#print("ASCII Coded char: ", codedChar," decoded char: ",textChar)

print("DeCoded string is: ",textOut)

**For my own secret code, each character has the ASCII Code of the character that comes three characters after it. The modifications were made in the areas that I have highlighted. This is called the “Caesar Cipher”.**

**Appendix: Sample Program**

"""

This program is currently immited to converting only the

characters "ABCD" and "abcd". The "asciiCodes" list can be easily

extended to include more letters and special characters.

This program currently uses the ASCII codes for converting text.

You can easily create your own secret code by changing the numbers

in the "asciiCodes" list.

"""

asciiCodes = [("A",65),("B",66),("C",67),("D",68)]

asciiCodes += [("a",97),("b",98),("c",99),("d",100)]

# This function codes the specified textChar into a

# three digit number padded with zeroes

def textCoder(textChar) :

for textCode in asciiCodes :

if (textCode[0] == textChar) :

return format(textCode[1],'03')

return "000"

def textDeCoder (codedChar) :

if (codedChar == "") or (codedChar == "000") :

return " "

for textCode in asciiCodes :

if (textCode[1] == int(codedChar)) :

return textCode[0]

return " "

# MAIN PROGRAM CODE STARTS HERE

print("Enter a password to code.")

textIn = input("password: ")

codeOut = ""

for textChar in textIn :

codedChar = textCoder(textChar)

codeOut = codeOut + codedChar + " "

#print("char: ",textChar," ASCII Coded char: ", codedChar)

print("Coded string is: ",codeOut)

print(" ")

print("Enter a coded password to decode")

print("(or return to use the Coded string)")

codeIn = input("Code: ")

if codeIn == "" :

codeIn = codeOut

codeList = codeIn.split(" ")

textOut = ""

for codedChar in codeList :

if (codedChar != "") :

textChar = textDeCoder(codedChar)

textOut += textChar

#print("ASCII Coded char: ", codedChar," decoded char: ",textChar)

print("DeCoded string is: ",textOut)